

## CLAIMS

1 1. Wireless communication apparatus for facilitating communication between terminals in  
2 a wireless network, comprising:

3 a power supply connecting section adapted for connection to a lighting power  
4 socket;

5 communicating means, connected to the power supply connecting section, for  
6 conducting wireless communication with the terminals and for communicating via the  
7 lighting power socket with one or more wireless communication apparatus connected  
8 thereto; and

9 a lamp connecting section, electrically connected to the power supply connecting  
10 section adapted to receive a power supply plug for lighting.

1 2. The apparatus according to claim 1, wherein said power supply connecting section  
2 includes a plug equivalent to the power supply plug for lighting.

1 3. The apparatus according to claim 1, wherein said lamp connecting section includes a  
2 socket equivalent to the socket for lighting.

1 4. The apparatus according to claim 1, said communicating means comprising:  
2 a power line communication control section, connected to the power supply  
3 connecting section and conducting communication via a power line with the other wireless  
4 apparata connected to the other power sockets for lighting;  
5 an antenna for wireless communication;  
6 a wireless communication control section, connected to the antenna for wireless  
7 communication and conducting wireless communication with the wireless terminals;  
8 and a communication control section, connected between the power line communication  
9 control section and the wireless communication control section, and transferring data  
10 between the power line communication control section and the wireless communication  
11 control section.

1 5. The apparatus according to claim 1, further comprising a unit power supply section  
2 connected to said power supply connecting section and converting output voltage of the  
3 power socket for lighting to a predetermined voltage to be supplied to said communicating  
4 means.

1 6. The apparatus according to claim 1, further comprising:  
2 a connecting switch placed between the power supply connecting section and the  
3 lamp connecting section; and  
4 a connecting switch control section for switching the connecting switch ON or OFF  
5 based on predetermined signals received by the communicating means.

1 7. A network system comprising:

2 a plurality of wireless terminals; and

3 a plurality of wireless communication apparatus for conducting wireless  
4 communication with the wireless terminals,

5 wherein each of said wireless communication apparatus includes:

6 a power supply connecting section connected to a power socket for lighting; and

7 communicating means, connected to the power supply connecting section for  
8 conducting communication between the wireless terminals and one or more of the plurality  
9 of wireless communication apparatus.

1 8. The system according to claim 7, wherein each of said wireless communication apparatus  
2 further includes a lamp connecting section, electrically connected to the power supply  
3 connecting section and to which a power supply plug for lighting is connected.

1 9. The system according to claim 7, wherein said power supply connecting section of the  
2 wireless communication apparatus includes a plug equivalent to the power supply plug for  
3 lighting.

1 10. The system according to claim 9, wherein said lamp connecting section of the wireless  
2 communication apparatus includes a socket equivalent to the socket for lighting.

1 11. The system according to claim 7, wherein said communicating means of the wireless  
2 communication apparatus comprises:

3 a power line communication control section, connected to the power supply  
4 connecting section and conducting communication via a power line with the other wireless  
5 communication apparatus connected to the other power sockets for lighting;

6 an antenna for wireless communication;

7 a wireless communication control section, connected to the antenna for wireless  
8 communication and conducting wireless communication with the wireless terminals using  
9 the antenna; and

10 a communication control section, connected between the power line communication  
11 control section and the wireless communication control section, and transferring data  
12 between the power line communication control section and the wireless communication  
13 control section.

1 12. The system according to claim 7, wherein each of said wireless communication  
2 apparatus includes the unit power supply section connected to the power supply connecting  
3 section and converting the output voltage of the power socket for lighting to a  
4 predetermined voltage to be supplied to the communicating means.

1 13. The system according to claim 8, each of said wireless communication main units  
2 further comprising:

3 a connecting switch placed between the power supply connecting section and the  
4 lamp connecting section; and

5 a connecting switch control section for switching the connecting switch ON or OFF  
6 based on predetermined signals received by the communicating means.

1 14. A method of communicating between wireless terminals in a wireless network  
2 comprising the steps of:

3 receiving information transmitted from a first wireless terminal, using a first  
4 wireless communication apparatus connected to a first lighting power socket;

5 transmitting, through a power line, the information received by the first wireless  
6 communication to a second wireless communication apparatus connected to a second  
7 lighting power socket; and wireless transmitting the information received by the second  
8 wireless communication apparatus to a second wireless terminal.

1 15. A wireless communication apparatus for facilitating communication in a wireless  
2 network comprising:

3 a power supply connecting section adapted for connection to a lighting circuit;

4 communicating means, connected to the power supply connecting section, for conducting  
5 wireless communication with at least one wireless terminal and for communicating with  
6 another similar wireless communication apparatus by means of the lighting circuit.